

## RESIDENTIAL LIFESTYLES AND ITS RELATIONSHIP WITH RESIDENTIAL ENVIRONMENT EVALUATION: A CASE STUDY OF SAGA CITY, JAPAN

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**ABSTRACT:** With the diversification of personal sense of values, as well as the abundance of lifestyles, people's demands on residential environment are becoming more and more abundant. In this paper, by the case study of Saga City, the approaches to grasp the residential lifestyles are analyzed at first. Then, through each approach, the residential lifestyle patterns were classified, and the characteristics of each pattern were grasped. Furthermore, the relationship between residential lifestyle and residential environment evaluation are analyzed, and the suitable models for various styles were established. The results not only can be used as the rudimentary data for the improvement and development of residential environment, the methodology of considering residential lifestyle can also bring about a new and useful viewpoint for the further research of residential environment evaluation.

**Key Words:** Residential lifestyle, residential environment evaluation, personal property, residential preference

### BACKGROUND AND OBJECTIVES

The efforts to improve residential environment quality started as early as the origin of human beings and their living places, for residential environment is not only the rudimentary request of the quality of life, but also the main support of the activities of economy, culture and society. Therefore, the improvement of residential environment quality is one of the main targets of the city policy and urban planning.

In the researches of residential environment, evaluation model is one of the basic and important topics, on which many papers have been published, and several evaluation index systems and models have been established. Ric van Poll conducted several questionnaire surveys on the source of annoyance in urban residential environment (Ric van Poll 1997). Marino Bonaiuto et al. present two instruments measuring the quality of the relationship that inhabitants have with their urban neighborhoods, consisting of 11 scales measuring the perceived environmental qualities of urban neighborhoods and one scale measuring neighborhood attachment. (M. Bonaiuto et al. 2003) R. W. Marans described the

subjective and objective indicators measuring the quality of community life. (R. W. Marans, 2003) In Japan, there are also many researches which aimed at establish the residential environment indexes by diversified surveys, such as studies in large cities as Tokyo and Kitakyushu (Yasushi Asami 2001), as well as in local city Saga (Ge et al. 2004). However, most of the researches are limited to the general evaluation indexes and model by considering the common conditions of urban residents. Actually, in recent years, with the diversification of personal sense of values, as well as the abundance of lifestyles, people's demands on residential environment are also becoming more and more abundant. Accordingly, the research on residential environment evaluation models should also be improved by considering various residential lifestyles. However, these kind researches are deficient by now.

On the other hand, the researches on residential environment evaluation always focused on big central cities by now, in which two typical residential patterns have been identified, which are center residential pattern and suburb residential pattern (Takahashi M. et al., 2000). The center residing

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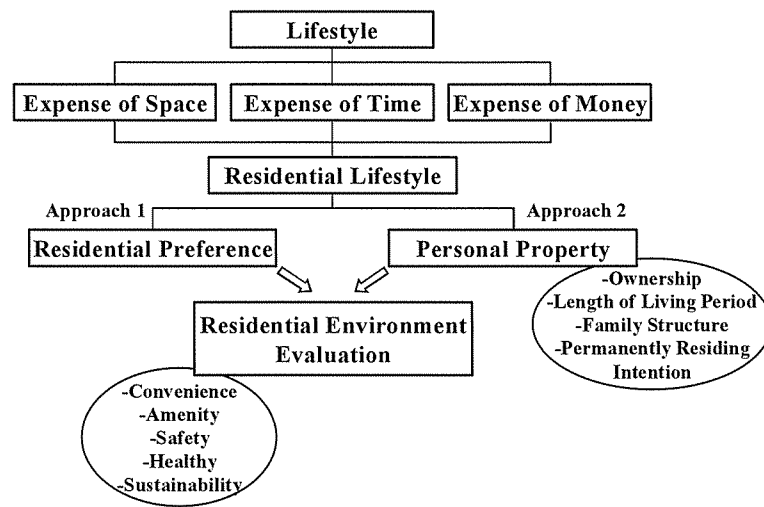


Fig. 1 Grasping of Residential Lifestyles and the Influence on Residential Environmental Evaluation

pattern aims at the convenience of downtown, while the suburb residing pattern pursues the rich nature and amenity of life in suburb; and some researches on the development or improvement of residential environment were also performed according to such two residential patterns in large cities. However, in small local cities, because of the different city scale and natural conditions compared with large cities, as well as the different lifestyles such as the commute to work and school, the spending of leisure time, the residential pattern of local cities should also be established, in order to grasp the characteristics of each pattern for the development or improvement of residential environment.

In this paper, by the case study of Saga City, the approaches to grasp the residential lifestyles are analyzed at first. Then, through each approach, the residential lifestyle types were classified, and the characteristics of each type were grasped. Furthermore, the relationship between residential lifestyles and residential environment evaluation are analyzed; the suitable models for various types were established. The results not only can be used as the rudimentary data for the improvement or development of residential environment quality of local cities, the methodology considering residential lifestyles can also bring about a new and useful viewpoint for the further research of urban residential environment.

#### APPROACHES TO GRASP RESIDENTIAL LIFESTYLES

In this research, residential environment is not limited to the indoor environment and the scope of housing, but includes the comparatively wide range of neighborhood. On the other hand, lifestyle is generally understood as the typical way of life of an individual, group or culture, thus the lifestyles related to residence are caught hold of as the notion of residential lifestyles which is defined as the way of life related to residence, influenced by the household structure, living condition, senses of value and so on, coming along with the consumption of time, space and money. The structure and components of residential lifestyle of human beings are very comprehensive and complicated, with very many influencing factors and personal differences, so that it is quite difficult to be grasped directly. Therefore, we proposed two approaches to grasp the residential lifestyle indirectly here, as shown in Figure 1: the approach of personal property and the approach of residential preference. The first approach mainly refers to the objective properties of residents such as ownership of the housing, family structure, length of residential period, intension of permanent residing, and so on; while the second approach is mainly about the subjective personal preferences to residence. These two aspects are considered as the main factors determine the residential lifestyles from the

viewpoints of objective conditions and subjective preferences; therefore through these two approaches, we can grasp the residential lifestyles indirectly.

## QUESTIONNAIRE SURVEY

From October through December 2002, a questionnaire survey was performed in five residential areas of Saga City and two residential areas in the suburb around the city. Altogether 1884 householders were selected randomly and sent a questionnaire. Table 1 shows the sample numbers and response ratios in each residential area. The response ratios differed significantly across residential areas, ranging from 38.2% to 66.0%, and the overall response ratio is 51.1%. The questionnaire was made up of 70 questions divided into three parts, shown in Table 2.

Table 1 Samples and response of the questionnaire

Area	Residents Number	Distributed Number	Response Number	Response Rate (%)
Kanko	2,725	270	144	53.3
Akamatsu	3,696	250	117	46.8
Kaisei	3,405	240	127	52.9
Hyogo	3,291	250	135	54.0
Kubozumi	1,447	170	65	38.2
Morodomi	3,585	244	161	66.0
Yamado	6,620	460	213	46.3
Overall	24,769	1884	962	51.1

Table 2 Structure of Questionnaire

	Question Contents	Question Number
Personal Property	age, sex, occupation, time spent to job, family structure, residential period, hobby, ownership, etc.	12
Residential Preference	Evaluation on residential preference when selecting dwellings	22
	Safety	8
	Healthy	9
	Amenity	6
Evaluation on Residential Environment	Convenience	8
	Community	5

## ANALYSIS ON EVALUATION OF RESIDENTIAL ENVIRONMENT

We first analyzed the average evaluation on residential environment evaluation with all samples, to establish a general evaluation model. Then we tried to establish a more detailed evaluation model by considering residential lifestyles through the approach of personal property and the approach of residential preference, in order to grasp the influence of residential lifestyles on residential environment evaluation.

### General Evaluation Model with All Samples

The general evaluation results on residential environment by all samples are shown in Figure 2, with 5 -grade evaluation scale. We can see that the evaluation on the item Safety is the lowest, while on other items are almost the same. According to the multi-regression analysis, we obtained the regression equation of the general evaluation model as shown in Equation (1), with  $R^2$  of 0.55.

$$\text{Satisfaction} = 0.14 \times \text{Convenience} + 0.26 \times \text{Amenity} + 0.21 \times \text{Healthy} + 0.14 \times \text{Safety} + 0.36 \times \text{Community} \quad (1)$$

It can be seen that the relative importance of the item Community is at the first place, and then are the items Amenity, Healthy, Convenience and Safety.

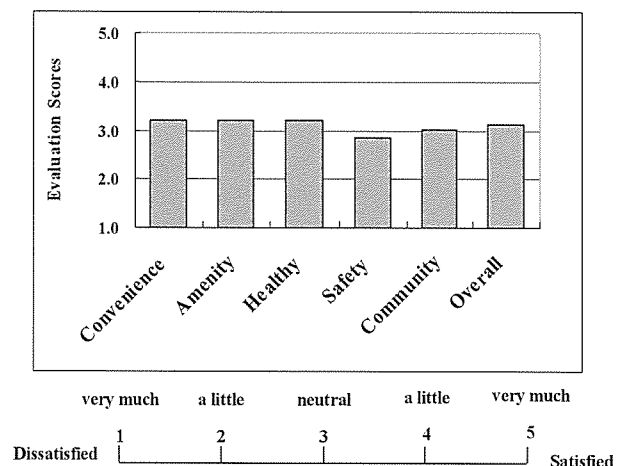


Fig. 2 Overall Evaluation on Residential Environment

Table 3 Multi-regression analysis on residential environment evaluation with all samples

Variable	Standard Regression Coefficient	F	Judge mark
Convenience	0.14	33.71	**
Amenity	0.26	101.32	**
Healthy	0.21	71.43493	**
Safety	0.14	30.3 4	**
Community	0.36	245.98	**

Note: \*\* means analysis accuracy is good under the tolerance of 0.01 (99% confidence)

Evaluation considering residential lifestyles through the approach of personal property

The classifications of personal property were performed according to four aspects: family structure, ownership, length of residential period and permanently residing intention.

#### *Family structure*

There are mainly three types of family structure: nuclear family (64.5%), single parent family (7.8%) and extended family (27.7%). The evaluations on each residential environment items by various types of family structure are considerably different. Nuclear families appear to have highest evaluation on almost all the items, while single parent families are with the lowest evaluation. This result is understandable, because in nowadays, the number of nuclear families ranks first in Japan, and the policy of urban development is sure to consider most for them and make their residential environment more satisfied; while other two types, especially the single parent families are sure to face with much more problems with residential environment. The relative importance on each residential environment items considered by the three types are also varied, see Table 4, which is obtained through multiple regression analysis. The item Community is considered to be the most important component by nuclear families and extended families, while Amenity is considered most important by single parent families.

#### *Ownership*

Ownership can be divided into such four types as owner-occupied housing (23.5 %), public housing

Table 4 Relative importance of residential environment components by family structure

	No.1	No.2	No.3	R <sup>2</sup>
Nuclear Family	Community (0.39)	Amenity (0.19)	Healthy (0.16)	0.537
Single Parent Family	Amenity (0.37)	Community (0.31)	Healthy (0.17)	0.644
Extended Family	Community (0.43)	Amenity (0.22)	Healthy (0.13)	0.584

(37.1 %), privately rented housing (28.9 %), and employer-provided housing (10.5 %). As to the comprehensive evaluation on residential environment satisfaction, the evaluation from the type of owner-occupied housing appears to be highest; then are the types of public housing, privately rented housing, and employer-provided housing. The most apparent difference among all the four types is the evaluation on the item Amenity, in which the evaluation from the type of owner-occupied housing ranks first, while the last place gives to the type of privately rented housing. As to the relative importance of each items, the type of owner-occupied housing considered Community as the most important component, while the other 3 types gave the first place to Amenity.

#### *Length of residential period*

The personal property can also be classified into 4 types according to the length of residential period: less than 5 years (37.6%), 5-10 years (25.0%), 10-15 years (16.6%), and more than 15 years (20.8%). The evaluations on residential environment and the relative importance of each item by different types do not have considerable differences, except that the evaluation on the item Community is raised with the increasing of the length of residential period, which can be explained as the establishment of sound community depends a lot on the residential period.

#### *Permanently residing intention*

The property of permanently residing intention can be classified into 3 types, which are: wishing to continue to reside (72.4%), wishing to move house (14.2%), without consideration (13.4%). It is apparent that the type that wants to continue to reside has the highest evaluation on all items, while the type that wants to move evaluates worst. As to the permanent residing reason, the multiple regression analysis

shows that community is considered most important. On the other hand, the type who wanted to move considered more about improving their residential amenity.

According to the above analysis we can find that personal properties such as family structure, housing ownership, living time and permanently residing intention had considerable influences on the residential environment evaluation both in the aspects of satisfaction and relative importance of each items. Different types have different demands and evaluation standards in their minds. The classification and analysis of personal property is one of the effective approaches to grasp residential lifestyle and its influence on residential environment evaluation.

Evaluation considering residential lifestyles through the approach of residential preference

#### *Classification of residential preference*

Through the questionnaire survey, we asked the residents to evaluate the importance of each residential environment components if they are assumed to select dwellings. According to the importance evaluation, we firstly use Principal Component Analysis to classify the residential preference. From the results shown in Table 5, five principle components have been extracted: 1<sup>st</sup> - comprehensive; 2<sup>nd</sup> - community + amenity; 3<sup>rd</sup> - community + commute convenience; 4<sup>th</sup> - amenity + daily life convenience; 5<sup>th</sup> - amenity + commute convenience. According to these results, the main residential preferences are in the orders of: comprehensive; community + amenity; community + commute convenience; amenity + daily life convenience; and amenity + commute convenience. The cumulative percentage of variance shows that the above five principal components can explain the residential preference quite well, with the cumulative 69.2%, in which the first and second factors served as 48.2%.

A Cluster Analysis was then conducted according to the component values of all residents obtained by Principal Component Analysis in order to classify the residential preference type. The results showed that three groups have been classified, with the ratio of 33.3%, 38.3% and 28.4% among all the samples respectively.

Table 5 Results of principal component analysis

Component	Eigen-value	Percentage of Variance of Component (%)	Cumulative Percentage of Variance (%)
1 <sup>st</sup>	5.86	36.60	36.60
2 <sup>nd</sup>	1.85	11.59	48.19
3 <sup>rd</sup>	1.39	8.66	56.85
4 <sup>th</sup>	1.06	6.60	63.45
5 <sup>th</sup>	0.91	5.71	69.16

#### *Characteristics of Residential Preference Type*

According to the multiple regression analysis, we obtained the following three evaluation equations of the three types respectively, from which we can grasp the varied relative importance priority of each type, as shown in Equation (2).

$$\text{Satisfaction} = 0.17 \times \text{Convenience} + 0.26 \times \text{Amenity} + 0.26 \times \text{Healthy} + 0.14 \times \text{Safety} + \mathbf{0.26} \times \text{Community} \quad (2-a)$$

$$\text{Satisfaction} = 0.09 \times \text{Convenience} + 0.26 \times \text{Amenity} + 0.21 \times \text{Healthy} + 0.18 \times \text{Safety} + \mathbf{0.37} \times \text{Community} \quad (2-b)$$

$$\text{Satisfaction} = 0.26 \times \text{Convenience} + 0.15 \times \text{Amenity} + 0.21 \times \text{Healthy} + 0.19 \times \text{Safety} + \mathbf{0.35} \times \text{Community} \quad (2-c)$$

All of the three types appeared to consider Community as the most important factor for the residential environment for the coefficients of Community are the highest in Equation 2, the same result as analyzed in the general model shown in Equation 1. Meanwhile, the following conclusions can be drawn, and the characteristics of each group, including the characteristics of residential environment evaluation, residential preferences and personal properties are shown in Table 6.

Type 1: Comprehensive Type: The residential preferences on various components of this type are almost at the same level, so that it can be defined as Comprehensive Type. The evaluation on each items are comparatively high.

Type 2: Amenity Suburb Type: Among all samples, this type is featured as emphasizing on amenity, and the samples from suburb areas account for the highest percentage. Their evaluations on community and amenity are high, while on convenience are low. It can be defined as the Amenity Suburb Type.

Type 3: Convenience Center Type: Compared with other types, this type is characterized as emphasizing

Table 6 Characteristic of residential preference types

Type	Residential environment evaluation	Personal properties	Residential preference
Type 1 33.3%	evaluation on amenity, healthy, safety, convenience to work/school are quite high	Ratio of nuclear family is the highest	Almost all items are with average importance
Type 2 38.3%	evaluation on amenity, community are high; evaluation on convenience is low	Ratios of owner-occupied housing, nuclear family; suburb residents are high	Preferences on amenity, community are high
Type 3 28.5%	Evaluation on convenience is high; evaluations on amenity, safety and community are low	Ration of downtown residents is high	Preference on convenience, community are high, especially convenience to work

on convenience, especially on the convenience to working, and the samples from center areas of Saga City are most in this type. The evaluations on convenience of this type are quite high, while those on amenity and safety are low. It can be defined as the Convenience Center Type.

## CONCLUSIONS

In this research, through the case study of Saga City, the concept of residential lifestyle was presented, and the two approaches to grasp residential lifestyles are analyzed, which are the approach of personal property and the approach of residential preference. Then the influence of residential lifestyles on residential environment evaluation was also analyzed through the both approaches. Furthermore, the suitable evaluation models for various residential lifestyles types were established. The results not only can be used as the rudimentary data for the improvement or development of residential environment quality of local cities, the research methodology considering residential lifestyles can also bring about a unique and useful viewpoint for the deep researches of residential environment.

In the future, it is necessary to make clear the relationship between residential lifestyles and regional properties, such as those of low land, so that it can benefit to the development of residential environment more efficiently and effectively.

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